

Settings Log LA

Settings report for Acnet

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Introduction

This document describes a local application that acts as an interface between the settings log data stream and the Settings Log Server implemented in Acnet via a task running on node `cfss.fnal.gov` that accepts a special protocol via a UDP port# used for that purpose. Setting records of a special format are written into this data stream from page application that run in a local station/IRM.

LA parameters

Example parameters as shown on Page E for the SLOG LA are as follows:

ENABLE	B<00C4>	SLOG ENABLE	<i>Enable Bit#</i>
DB PREFIX	<4C3A>		<i>'L:'</i>
IPADR HI	<83E1>		<i>cfss.fnal.gov IP address</i>
IPADR LO	<797A>		<i>131.225.121.122</i>
RPT DLY	<000A>		<i>10 seconds report delay</i>
REM DLY	<0258>		<i>600 seconds removal delay</i>
LISTNUM	<000C>		<i>list# for data stream data request</i>

The `DB PREFIX` parameter is a two-character ascii prefix to all 6-character device names for preparing the settings report message that must include the 8-character device names used in Acnet. For example, the Linac device name prefix is "L:". Parameters `IPADR HI` and `IPADR LO` specify the IP address for node `cfss.fnal.gov`. This node houses the settings log server to which all settings reports are sent for logging. The `RPT DLY` parameter is the "report delay" in seconds. It specifies the delay after a setting is made before a report will be sent. Its purpose is to allow a chance for the setting activity of other devices to be queued for inclusion in a single report message. The `REM DLY` parameter is the "removal delay" in seconds, after which time the queued entry is removed. During this time, additional settings of the same property made to the same device will not be re-reported. Its purpose is to reduce network traffic resulting from "knobbing" an analog device. The `LISTNUM` parameter is used for the internal data request that monitors the contents of the settings log data stream.

Settings reporting

Upon initialization, the SLOG LA allocates a settings queue into which setting log activity that relate to Acnet device names are queued for eventual inclusion in settings log reports. When a setting is observed by the LA in monitoring the records in the settings log data stream, its listype# is checked for those of interest to Acnet.

This table lists these listype#s:

Analog setting property
1 setting

- 7 relative "knob" setting
- 39 delta setting
- 41 engineering units setting
- 44 engineering units delta setting

Basic control property

- 22 digital control via Chan

Analog alarm block

- 2 nominal value
- 3 tolerance value
- 4 alarm flags w/o \$4000 bit
- 42 engineering units nominal
- 43 engineering units tolerance
- 57 D0 alarm parameters

Digital alarm block

- 2 nominal value
- 3 mask
- 4 alarm flags w/ \$4000 bit

A settings log queue entry is as follows:

```
RECORD
dName: PACKED ARRAY[1..6] OF Char; { device name }
sMask: Byte; { set properties mask }
rMask: Byte; { reported properties mask }
remov: Integer; { time out until entry removed from queue }
nRprt: Integer; { number of reports }
nSets: Longint; { number of settings to this device }
END;
```

The setting records monitored are only those that are sent from an application such as the parameter page or the analog descriptor page, as only such records include a device name. Assuming that the queue is empty, and a setting of one of the above listypes is detected, then get the analog name from the channel descriptor. If it is valid, then build a new entry in the queue. Set a bit in the `sMask` field according to the setting property used. Set the `rMask` field to zero, as no properties have yet been reported. Set the `remov` field to the `REM DLY` parameter. Set the global report delay timer `rDTimer` to the `RPT DLY` parameter.

If a setting is encountered for a device whose entry is already in the queue, set the appropriate bit in the `sMask` field, then check whether `sMask = rMask`. If they are equal, then this property has already been reported to cfss in the last removal delay period,

so this one can be ignored. If they are not equal, and the rDTimer is zero, then set it to the `RPT DLY` parameter to insure prompt reporting of the new-property setting.

Every second, decrement the rDTimer, if nonzero. When zero is reached, review all queue entries and build a report message that includes all unreported properties of all devices in the queue.

Every second, also decrement the `remov` field in each entry. If it reaches zero, and `rMask = sMask`, all properties have been reported, so remove the entry from the queue. If it reaches zero, and `rMask <> sMask`, then some properties for this device have *not* yet been reported, so reset the `remov` field to twice the `RPT DLY` parameter. The rDTimer should already be active in this case. This extra time should give a chance for the unreported properties to be reported before the entry is removed.

When issuing a report message, the LA uses the acknowledgment typecode option for the cfss-based server. This causes the server to return an acknowledgment, which is used to set the rMask bits according to the mask that was reported. If there is no acknowledgment received within a second, then re-issue the report up to two times before giving up.

Device name prefix

The prefix used for all Linac devices is “L:”. Devices at the MRRF test station are “Z:”. From the local station application point-of-view, the correct prefix cannot be known. So, for all reports issued by a given station, a parameter of the LA is used as a prefix. In cases where a target device is in another node whose devices use a different prefix, the report will indicate the wrong device name. For a device with a name which the setting log server cannot find in the Acnet database, the server will perform a search throughout the database looking for a match on the last 6 characters of the device name in order to complete the setting log record.

Station identification

Each station has a 16-character text title that usually shows where it is located. For example, node 0508 has the title “LINAC SUN ROOM”. In the settings log protocol, there is an 80-character owner field for each report message. Besides the node#, the node’s title is included, normally identifying the local station’s location.